BNL E896 Status Report

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The E896 experiment is a search for the creation of the H_0 stranglet in relativistic heavy ion collisions. The H_0 is an uncharged particle consisting of 6 quarks; specifically two **u**'s, two **d**'s, and two **s**'s. In this experiment, formation of the H_0 would be observed by witnessing its weak decay into charged daughter products (e.g. $H_0 \rightarrow \Sigma + p$) in a large multi-planed drift chamber or a smaller silicon based detector. Those decays taking the form of a "V" originating in the active volume of the detector.

The problems reported from the February 1997 engineering run, were solved and repairs to the Sweeper magnet, the distributed drift chamber (DDC), and the DDC front-end electronics were affected[1]. The first data taking run was completed in May 1998. Over 10^8 central Au-Au events were recorded during that period. This data set is expected to yield 10^6 K_{short}, 10^6 Λ, 10^4 di-Λ and theoretically (based on Λ coalescence[2]) 50 H_0 reconstructable particles.

Analysis is currently underway to cull the events containing those particles from the data set. At this time a first pass through all the data has been completed. A rudimentary filter program to identify V's produced by Λ decays, was implemented during that pass. An Armentaros analysis of a subset of those candidate V's from that pass is displayed in Figure 1. Comparing the results of this reduced data sample to results of Monte Carlo simulations has enabled us to refine the filtering program. The filter efficiency, determined to be running at 10% in that first pass, has been increased to~50%. A second pass through the data to augment the V rich event sample and to determine the values of several calibration constants needed for the analysis of the different detectors used in the experiment has begun. This second pass is expected to completed in February.

Meanwhile work has continued using GEANT, STAF, TDC interpolation codes, etc. to refine event simulations and detector response functions so that the Monte Carlo data more nearly mimic the 98 data set. Using a combina-

tion of real and Monte Carlo data the geometric acceptance for V's which originate in the DDC has been determined to be 7.8%. An initial check on the reconstruction efficiency for tracks associated with V's imbedded in typical data event, showed only a 40% efficiency. However, more recent work indicates that it should be possible to increase the track reconstuction efficiency for found particles to better than 90%.

As the first pass Λ filter should be sensitive to H_0 decays, the resultant set of 200K "V-rich" events is currently being scrutinized using different track reconstruction codes for clear evidence of the H_0 particle's existence. Work comparing the Λ polarization from this data set to a p-Au data run completed last summer is also underway. Analysis of events containing at least two Λ particles is also being pursued using the current "V-rich" data sample.
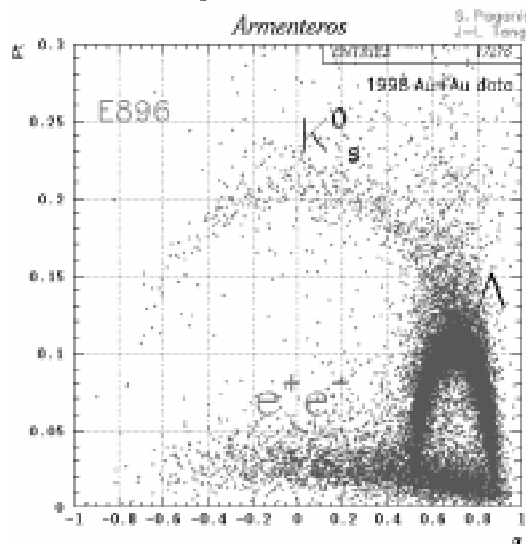

Figure 1. Armenteros plot for sample of Λ candidates from pass 1. Absence of $\overline{\Lambda}$'s is an artifact of the Λ finder requiring a stiff positively curved track.

1. J.Engelage, LBL-37384 (1997) 125.
2. A.Baltz et al., Phys.Lett.**B325** (1994) 7.